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ABSTRACT

This review of the current state of research on how children make sense of television and its content examines age-related differences in children's interpretations of television entertainment content in general, and advertising content in particular. A brief analysis and description of the fundamental principles of cognitive development theory are offered in section one, including a brief review of crucial terms, assumptions, and characterization of the changing cognitive skills available to children, as well as a critique of cognitive development theory with emphasis on the work of Piaget. Section two reviews the growing literature on children's information processing of television dramatic program content. The discussion in the next section focuses on several pragmatic questions regarding children's understanding of the purpose of television and their information processing of advertising content. The paper concludes with an explanation of some of the possible policy options which seem unwarranted by the preceding review. (Author/CMV)

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Children and Television: The Development of the Child's Understanding of the Medium

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CHILDREN AND TELEVISION:

THE DEVELOPMENT OF THE CHILD'S UNDERSTANDING OF THE MEDIUM

Children have long been recognized as a special audience for media presentations, particularly television (Schramm, Lyle & Parker, 1961). From an adult's perspective, children have different cognitive or thinking abilities and more limited experience to help them make sense of television. The work of Jean Piaget (1928, 1950, 1954) and American cognitive developmental researchers (Flavell, 1977) has provided the general orientation to research examining children's understanding of television. What is it about how children think about television, how they construe meaning from television messages, and how they understand the televised world that makes children a "special audience"? This paper will attempt to answer these questions, by reviewing the current state of research regarding how children make sense of television and its contents. In sections two and three of the paper, a review of age-related differences in childrens' interpretations of television entertainment content in general and advertising content in particular will be offered.

The thrust of the most recent research regarding children's understanding of television messages is that children of different ages bring different information processing skills to the television viewing situation. That is, during childhood, children are growing and changing both in the available cognitive abilities, or ways of thinking, and in their understanding of their social world. These developing abilities are then reflected in the ways in which children of different ages understand television messages. The nature of the age differences in how children "think" about and understand television and its content then is the focus of this paper.

The organization of the paper is as follows: First, a brief analysis and description of the fundamental principles of cognitive development theory will

be offered in section one. Since previous reviews of research on children and television have offered fuller descriptions of cognitive development theory (see, for example, Roberts, 1979; Ward, et al., 1977; and Wartella, 1979), a brief review of the crucial terms, assumptions and characterization of the changing cognitive skills available to children will be presented. Furthermore some critique of cognitive development theory, especially Piaget's theory will be offered. Secondly, the growing literature on children's information processing of television dramatic programs content will be reviewed in section two. Thirdly, the discussion in section three will focus on several specific pragmatic questions regarding children's understanding of the purpose of television advertising and their information processing of advertising content. In the last section, a post-script, I will examine some of the possible policy options which seem unwarranted by the preceeding review.

Section I. Fundamental Principles of Cognitive Development Theory.

This section will present a theory of child development which is widely used in research in developmental psychology, cognitive development theory. Some of the basic concepts, assumptions and broad outlines of cognitive development theory are discussed. Furthermore, a brief review of major criticisms of cognitive development theory is offered. This section concludes with a recommendation that research on children's understanding of television messages be examined for age-related differences since children's abilities to make sense of television change greatly as children grow older.

The truthfulness of the statement that children think differently than adults is fairly self-evident. Any adult who has spent even passing time with a preschooler or elementary school child recognizes that young children are not miniature adults. The young child (those below middle childhood or about age seven) in particular, has a qualitatively limited manner of perceiving, thinking, and

interacting with other people, when measured by adult-standards. Attempts to describe how children grow and develop in the way they think about and interact with their physical and social world has led to the emergence of cognitive developmental theories. The most famous cognitive development theory, and thus, the one which has received the most research attention, is that of the Swiss psychologist Jean Piaget (Gruber and Voneche, 1977; Flavell, 1963, 1977).

Cognitive development theory is a "theory of knowing" (Gruber and Voneche, 1977: p. ix): it attempts to describe how children think or process information. Piaget's nearly sixty years of work (Piaget, 1923) has been devoted to the articulation of a theory of how humans come to know their physical and social world. Certain aspects of his theory are crucial for understanding the thrust and meaning of cognitive developmental notions: first Piaget's theory is a stage theory of development. That is, he posits that children undergo qualitative changes in the way they organize and use information. Secondly, he posits a set of cognitive structures to characterize children's thought processes at distinct, age-related stages of intellectual development. The development of cognitive structures is universal and proceeds through the process of an active child both accommodating to and assimilating new cognitive events into his or her level of cognitive abilities.

A particular stage of development is a description of the cognitive abilities children possess at that level of development. Each stage roughly approximates certain age levels--roughly, that is, since current research is being devoted to examining how closely particular cognitive abilities follow the expected age guidelines suggested by Piaget's theory (see, for example, Case, 1974). The different periods of development in Piaget's theory, his stages, then are correlated with age, but are not synonymous with age of the child. Moreover, the range of abilities available to children at any given stage of development is

said to form a structured whole (Kohlberg, 1969); that is, one stage is different and discontinuous from the next stage, and at a given stage of development a child will respond to a variety of tasks according to this underlying thought organization or stage of cognitive abilities. Thus, the different cognitive abilities available to a child at a given level or stage of development are organized into a whole pattern of response across a variety of tasks which may not seem similar on the surface.

While the age ranges typically associated with Piaget's theory are not hard and fast, the crucial concept of stage serves as a convenient term for summarizing and describing children's cognitive abilities through the course of childhood development. Piaget posits four major stages in the course of cognitive development: the sensorimotor stage (birth to about age 2); preoperational stage (ages 2-7), concrete operational stage (ages 7-12) to formal operational stage (12+). Descriptions of the four stages of development Piaget identifies are a useful way of elaborating the differences in children's thinking.

The sensorimotor stage is characterized by behavioral patterns of thought, what Piaget calls schema. It is through touching, grasping, sucking, and operating on objects that the child is "thinking." There is no symbolic representation of objects, since the importance of this stage is that the child develops a sense of separateness between self and the world around him. It is during this stage that the child is learning to react to objects and people immediately present.

It is during the next stage, preoperational (ages 2 to about 7 years) that the child begins to develop cognitive reasoning ability, symbolic ability and mental imagery. Piaget characterizes the mental process of this stage as a "mental experiment" in which the child duplicates in mental imagery the various objects he/she is "thinking" about. Children's thought is very closely linked to perception--they rely on the immediate perceptible qualities of objects as

the basis of logical reasoning, what has been referred to as perceptual boundedness (Wohlwill, 1962; Ward and Wackman, 1973; Wartella and Ettema, 1974). For instance. Ward and Wackman (1973) illustrate the concept of perceptual boundedness by noting that the five and six year olds they studied focused on the visual aspects of TV messages rather than the content of functional distinctions among different kinds of messages. That is the younger children were "bound" to the "perceptual" or surface characteristics of the television stimuli. Furthermore, during this stage children tend to be egocentric in their dealing with the world, that is they tend to see the world from their own perspective.

With the development of concrete operations (ages 7-12) the child acquires the ability to separate perception from other forms of thought and knowledge, that is he/she can separate appearances from reality. This stage of cognitive development is characterized by the growth of certain basic logical operations: elaborated cognitive abilities. For instance, during the stage of concrete operations, while the child has available all of the necessary cognitive abilities, the child is limited to applying these abilities to images of concrete objects and events; that is, abstract thought does not develop until the next stage of cognitive development, formal operations.

Formal operations (which develops about age 12) is characterized as the beginning of true adult-like thought pattern, in that the child develops abstract thought, hypothetical reasoning and propositional thinking.

This brief description of Piagetian stages of development points out how children become increasingly more "thoughtful" in their behavior as they grow older. That is, a major dimension of development is increasingly less reliance on the apparent perceptual characteristics of objects and events. Two major dimensions of this thoughtfulness operate in tandem. First, children become less perceptually bound, that is they become less tied to the immediate surface or perceptual characteristics of objects and events and are able to take into

consideration other dimensions, such as the functional differences among objects. A second dimension of "thoughtfulness" is that as children grow older they become better able to coordinate multiple dimensions of phenomena, what has been called the dimension of decentration. Decentration again can be illustrated with reference to Ward and Wackman's (1973) research. They found that their older, nine to twelve year old children, were able to discuss visual, message content and functional distinctions between TV advertisements and programs. That is, the older children examined multiple dimensions of television messages.

These Piagetian stages of cognitive development are based on research on how children think about the physical world, such as children's conceptions of time (Piaget, 1946) space (Piaget and Inhelder, 1948) and physical causality (Piaget, 1927). Piaget and other developmental psychologists argue however, that the same logical, thinking abilities are reflected in children's thought about the social world (Flavell, 1977; Shantz, 1975).

The major thrust of development in social cognition for children is the decline of egocentrism and the development of role-taking skills. Egocentrism is the lack of ability to take another person's perspective into account. According to Selman (1971) children move through distinct stages of role taking abilities. The lower boundary of these stages is egocentric perspective taking when children confuse their perspective on objects and events with others' perspectives. This is characteristic of children below age 6. Children gradually become more aware that other people may have motivations different from their own to the point that the child is able to assume a third person point of view, such as when the child can say "Mother wants me to clean my room because it's dirty, but I want to play." For Selman, mutual perspective taking (age 10 through adult) is developed when the child understands that just as the child can look at the other's perspective so can others mutually examine the child's perspective.

Thus, role-taking skills involve the child gradually learning that other people have different feelings, thoughts, motivations and inner states from the child's own and from what may be apparent on the surface.

In short, as children grow older they learn to put themselves in the other's shoes to look at the world. They become less "gullible," self-centered, naive in social interactions. They become more flexible and capable of making inferences about how and why people behave as they do and about what the other sees, feels, thinks, intends and is like (Shantz, 1975).

What brings about development of cognitive and social inferencemaking abilities? According to Piaget, development occurs through the child interacting with his environment and involves both maturation of physical abilities and experiences with the world. The child, in a sense, then is constantly structuring and restructuring his ways of thinking about the world. Piaget uses the term equilibration to refer to this self-regulatory process that propels development. The child is trying to cope with his environment, by constantly accommodating to new events and assimilating these new events into his current level of cognitive abilities.

Here we come to one of the basic criticisms of Piagetian cognitive development theory: Whether development in terms of the stages Piaget describes unfolds universally in the same manner at the same rate. Can developmental growth be accelerated? Can children acquire a cognitive ability earlier than cognitive developmental theory would predict? Do children have to be "ready" before they can develop new cognitive abilities?

There are some preliminary answers to these questions. First, there is evidence from cross-cultural research that suggests there is a "time lag" in the development of cognitive abilities as Piaget describes them among children in non-Western cultures. Dasen (1977), in a collection of cross cultural studies,

argues that there may be a pro-Western culture and high social class bias in Piaget's work. However, there is cross-cultural evidence that children do show competence for cognitive structures, as Piaget defines them. Moreover, the appearance of these cognitive abilities in a given situation is culturally determined. In short, while there is some evidence that Piaget's stages of cognitive ability are universal, the rate of development and the appearance of these stages may vary culturally.

A second problem with cognitive development research is that children may not always perform up to their highest level of ability on any given task used to assess cognitive development. For instance, one potential confounding ability is language use. Siegal and Brainard (1978), in particular, argue that the typical Piagetian tasks used to assess cognitive ability are suspect because they rely on language abilities beyond the level of the children. Therefore, they argue that children may be cognitively able to perform a given task but aren't able to use language well enough to explain the concepts they understand. The competence (or the possession of a given cognitive ability) vs. performance (demonstration of that ability in a given situation) distinction raises issues regarding cognitive development research. Siegal (1978) in particular, argues that nonverbal testing methods must be used to assure that we are not confusing language difficulties for the lack of a given cognitive ability. Even aside from language use abilities, children may not always perform at their highest level of competence.

Third, there is evidence from a variety of studies that children may be able to "learn" a cognitive operation earlier than Piaget's theory suggests can occur. Research by Case (1974), Pascual-Leone (1969), and Field (1977) all indicate that when the learning environment appropriately respects the child's existing cognitive abilities and elicits the child's own activity in the learning

situation, that acceleration of development can occur. In short, by matching the learning environment to the child's ability there is evidence that you can "teach" the child new cognitive skills earlier than Piaget's theory of development suggests they would occur. This is not to say that research uniformly supports the notion of accelerating development. Research is mixed. Similarly, it is difficult to offer a typical rate of acceleration. In one study, Case (1974) reports a successful training procedure which increased eight-year olds ability to solve a complicated logical procedure which according to Piaget could not be learned until a child is fourteen or fifteen. On the other hand, Flavell (1977) in discussing research on children's abilities to communicate a listener's perspective on stories, notes the general lack of success in training children who have an egocentric perspective into an other-directed perspective in communicating stories verbally.

The implications of these critiques of Piagetian cognitive development theory are multiple. First, they suggest that one should be wary of making inferences from more theoretical literature on children's general cognitive development to children's responses to television. Secondly, they suggest that attention should be given to the particular tasks and measures utilized in research to assess children's ability levels. Thirdly, the critiques argue that one should be wary of arguments which maintain that children of given ages "can't do" certain things. To argue on the basis of Piagetian theory that five or six-year olds are incapable of some, even if modest, accelerated cognitive growth, in the absence of specific traning programs, may be premature. The recent neo-Piagetian research seems to suggest that where optimal learning environments can be developed modest cognitive growth may be encouraged for children. Lastly, these critiques would suggest that any review of the status of research on children's understanding of television should not be too closely tied to a discussion of "stage-related"

differences in comprehension of television. The stage concept may be less meaningful than simple descriptions of how children of various ages make sense of television.

On the other hand, there are positive contributions of cognitive development theory and research to our understanding of children and television. First, the literature that has been discussed above argues rather strongly for the notion that children's thinking and interpreting abilities change radically as they grow older. The way children attend to, interpret and comprehend the world about them seem to follow general dimensions of change. As I noted above, children become less bound to their immediate perception for cues to assess objects, and they become better able to use multiple dimensions of objects when trying to make sense of them. These processes have been referred to as the decrease in perceptual boundedness and the development of decentration as children grow older. Similarly, research on the development of social cognition presents evidence that children only gradually develop an understanding of other people and the motivations and consequences of human actions. Thus, this literature offers strong evidence for the importance of age as a variable of interest in research on children.

Secondly, the theory of cognitive development and surrounding research from this perspective offers some guidelines for research and policy. In particular, it suggests at what ages we might expect children's interpretations of television messages to change and the likely directions these changes might take. For instance, as I noted previously, major changes in cognitive abilities occur around middle childhood--what Piaget refers to as the shift from preoperational to concrete operational thought. Between the ages of seven and nine, children acquire a host of new thinking skills and reasoning abilities such as the ability to reverse thought processes and discover inconsistencies in logic and other abilities as discussed earlier. Similarly, we might expect there to be changes

in children's interpretations of television occurring around middle childhood. Research findings addressing this point will be discussed in the next two sections.

Thus, with this brief overview of cognitive development theory and this introduction to developmental changes in children's thinking and interpreting abilities, this paper will now turn attention to children's interpretations of television content.

Section II. Children's Information Processing of Television Content.

In this section of the paper, research on age-related differences in how children attend to (that is look at and listen to) and comprehend (that is, construe meaning from) television content will be presented. While most research on television and children has been concerned with whether or not children "learn" aggressive behaviors from watching television, there has been particular stress placed on what television does to children. More recently, emphasis has been placed on what children do to and with television. The focus here will be on how children's developing cognitive abilities and social experiences lead to increasingly better understanding of television messages. In order to examine how children process television content, the discussion will focus on two aspects of information processing: children's attention to television messages and their comprehension of these messages. Thirdly, a general discussion of children's understanding of television as a phenomenon will be presented.

A few brief comments about the concept of age differences might be in order before the review begins. Several recent reviews of children's responses to television (Comstock et al., 1978; Dorr, 1978; Wartella, 1979) have argued for the adoption of a developmental perspective in examining children's reactions to television. Typically, what is meant here are age-related descriptions of how children make sense of or process television messages. Age serves as a good marker or locator of both the child's level of cognitive development and degree

of experience with the social world useful for judging television reality. Thus, while age in and of itself is not a "cause" of differences in how children make sense of television, it merely serves to locate where differences will occur. Unfortunately, the adoption of this sort of age-related description of how children make sense of television is a relatively recent phenomenon. As Comstock et al. (1978) note, there are few studies which adopt a developmental perspective on children's social learning from television. Furthermore, most of this research has occurred within the last ten years. Therefore, many gaps in our ability to identify precisely age-related changes in children's processing abilities will be found. However, the review of the status of research in the remainder of this paper will try to describe developmental changes in how children make sense of television messages.

Attention to Television.

Marie Winn, author of The Plug-In Drug, is only one of the popular commentators who have referred to children's "passive, zombie-like" attention to the television screen. The analogy to drugs, television as a narcotic, is conjured up by images of five and six year old children sitting quietly, eyes fixed on a television set. How accurate are these descriptions? In general, what do we know about how children of different ages attend to television, what visual and audio factors capture children's attention?

The view of children passively watching the television screen is counter to the current psychological view of the child as an active cognizer of his or her world. Cognitive development theory, as we took great pains to point out in the preceding section, views children as active participants in their environment, actively striving to make sense of the world about them. The literature on

children's development of attention processes tends to support the active nature of attention development.[1]

Children's attention processes have been found to undergo decided developmental changes during the first seven or eight years of life: as children grow older they acquire greater control in allocating their attention to tasks and their attention becomes more selective. They are better able to ignore the irrelevant information and to focus on the relevant. In short, attention becomes more flexible and adaptable (Pick et al., 1975; Flavell, 1977). These same developmental principles of attention have been demonstrated in the few studies which have been conducted on children's attention to television.

First, the evidence regarding the passive or active nature of television viewing may be considered. It would appear that much of the criticism of "zombie-like" viewing of television comes from casual observation of children watching television. Where observational studies of children's visual attention to the television set have been conducted, they indicate that viewers pay varying levels of attention to television programs and commercials. In one study, Levin and Anderson (1976) report that on the average, preschoolers they observed looked at and away from the television about 150 times per hour. These studies have utilized various age groups from children as young as one year of age (Levin and Anderson, 1976) through adolescence. Furthermore, observations have been made in homes (Bechtel et al., 1972; Ward and Wackman, 1973); in schools (Wartella and Ettema, 1974) and in special laboratory viewing rooms (Anderson and Levin, 1976; Anderson et al., 1979; Krull and Husson, 1979).

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[1] The argument advanced here does not mean to imply, however, that children are as "active" when watching television as they are when engaged in athletics or doing other sorts of activities. Activity here is relative.

The studies on television attention discussed here rely primarily on measures of visual attention such as on observers' records of visual eye contact. Since children may still be listening to the television set although not watching the screen, visual attention measures may underestimate total attention to the television set.

Anderson and his colleagues (Anderson et al., 1979) have conducted a series of laboratory studies of children's attention to Sesame Street segments. Anderson's program of research highlights the active nature of children's attention to television: up until about age 2 and one-half children tend to orient themselves away from the television with few looks at the television screen. Starting at two, however, observers noted that children are engaging in what adults would consider television viewing: their bodies are oriented to the television set and even when not watching the set intently they are monitoring the set frequently to see if they should attend further. In Anderson and his colleagues (Anderson et al., 1979) observational studies among preschoolers, age is a good predictor of the amount of attention children will show to the television set: the older children more frequently gazed at the set, and past age three, the duration of any one look at the set is longer. They report that by age five or six, children's viewing of television is selective. While age appears to predict amount of attention to television among young children, Anderson et al., (1979) and others (Wartella and Ettema, 1974; Poulos et al., 1975), however, report that there is individual variation in attention at any age. It is therefore important to look at factors other than age which affect attention.

Several factors have been found to influence children's attention to the television: distractions in the viewing environment, the content and form of the television message; cycles or patterns of attention; and the comprehensibility of the message.

One of the few observational studies of children's attention to television in the home was conducted by Bechtel, Achelpohl and Akers (1972) who used in-home videotape cameras to survey family viewing patterns. Although they observed relatively few children in their study, they did note that children's television viewing was interrupted by time for reading, playing with pets and siblings, and talking to other people. It would seem that in the normal course of watching television that other distractions in the room take children's as well as adult's attention from the television set.

Anderson et al. (1979) report a recent laboratory experiment which demonstrates that even five-year-old children's attention is affected by distractors in the viewing condition--in this case toys in the room. Two groups of five-year olds were shown a Sesame Street program in one of two viewing conditions: first, there were toys to play with in the viewing room and second, where no toys were present to distract the children's attention. Visual attention to the screen was monitored continuously by an observer who depressed a recording button when the child looked away. Attention to the screen by the group of children who watched TV without toys in the viewing room was nearly double the attention of the children who watched with toys available.

The presence of other children in a viewing situation, however, in one controlled laboratory study was not found to distract four-year old attention to a segment of Sesame Street (Sproull, 1973). Several researchers have attempted to examine the relationship between the content of television and children's attention behavior.

Two studies have examined the kinds of content on television which tends to elicit young children's attention. There are some consistencies and inconsistencies in these two studies. Anderson and Levin (1976) as noted earlier recorded preschoolers attention to an hour long Sesame Street program. Poulos et al. (1975)

similarly recorded six to eight year old children's visual attention to an episode of Sesame Street. In both studies the researchers examined the relationship between the children's attention and the presence or absence of particular visual and auditory elements on the television program. Across the two studies, attention was found to increase in the presence of activity or movement on the screen. child actors, animation, puppets and eye contact. Poulos et al. (1975) also report that animals on the screen, pan camera shots and camera cuts also increased attention. Anderson and Levin (1976), however, found camera activity to have little effect on visual attention. Another discrepancy between the two studies is that while the presence of an adult female on Lassie was found to decrease six to eight year olds attention, adult females on Sesame Street were found to increase preschoolers attention. Static images in both studies tended to decrease attention.

In both studies, auditory elements such as background music, auditory changes, rhyming, repetition and alliterations, and peculiar voices tend to increase the young children's attention to the set. Anderson et al. (1979) after further investigation argue that auditory factors are most important in bringing children back to attention after they have tuned out for some reason. Comparable findings have been made in other work by Wartella and Ettema (1974) and Huston-Stein (1977).

Anderson et al. (1979) further explored the effects of these "bit changes" or changes in visual and auditory elements on the screen on eliciting, maintaining and terminating children's attention. They find that all bit changes, that is whenever there is a change in the visual or auditory elements on the screen, strongly influence a look at the screen for children who are not looking and tend to terminate a look when children already have their eyes on the set. Furthermore, it seems plausible that bit changes in the audio portion of the television would elicit the most impact on inducing visual attention as Anderson and colleagues

have found. On logical grounds, if the children are not watching television, only the auditory message could bring them back to visual attention--by cuing them that something new is on the screen.

Research on the range of formal features of television, that is the kinds of bit changes and content which do elicit movement in attention among young children, is still very preliminary. It seems likely that although preschool children may be highly susceptible to the perceptual changes on the screen (as indicated by Wartella and Ettema, 1974 and Levin and Anderson's work), older children's and adults' attention to television may also be influenced by such characteristics of the television message.

Moreover, there is some evidence that across all age levels attention to television is also influenced by patterns or cycles of attention which may not be related to cognitive developmental growth. For instance, both Anderson et al. (1979) and Krull and Husson (1979) refer to a pattern of attention they call "attentional inertia" a term which refers to the notion that viewers can become engrossed in a program with almost continual attention and without looks away from the set, for at least short periods of time. By "patterning," Anderson et al. (1979) are referring to regularities in viewing and not viewing the television set. For instance, Anderson et al. (1979) found that preschool children typically look at the TV for short periods: they report that 54% of all "looks" are for less than three seconds. However, they noted that when a look at the set lasted for longer than about 10 seconds, the probability increased that the viewer would continue watching initially for several minutes in a state of attentional inertia. Krull and Husson (1979) similarly found that a major factor influencing their four and five year old subjects attention to differing segments of a Sesame Street program was attention to the previous segment. In other words, there was high attention interdependence. They noted that these young 4 to 5 yea-

olds seemed slower to react and change their attention level across bit changes, than were older 7 to 9 year old children they observed watching an Electric Company program.

These cycles in attention, and the notion of attentional inertia, may describe a general process of attention. Anderson et al. (1979) report that such attentional inertia patterns have been demonstrated to characterize college students' television watching behavior in their laboratory tests. The question not yet answered is whether young preschool children are more susceptible to such attention inertia, and what conditions might increase the likelihood of such a pattern of viewing. If young children are found to be "more susceptible" to such attentional inertia, such a pattern of viewing might be what Marie Winn and other critics are referring to when they talk about the "zombie-like" television viewing patterns of young children.

A final factor which may influence young children's attention behavior is that of the comprehensibility of the message. Anderson et al. (1979) report a recent experiment examining two, three and five year old children's attention to a specially produced version of a Sesame Street program, made unintelligible through various editing techniques and running the soundtrack backwards. At each age of 2, 3, and 5, children attended less to the bits of the program that were rendered less intelligible.

It seems likely then that during the preschool years children begin to orient to the television set. By about age five, children's patterns of attending to television fairly much approximates adult-styles of looking and not-looking at the television. While at times children may appear glued to the television set (zombie-like viewing), these periods, at least in laboratory studies, appear to be of relatively short duration. Moreover, this attentional inertia is found not just among young children (although there is some evidence it may be more

pronounced among children under five than over age seven) but among older children, including college students. Further, there is increasing evidence that rather than the passive television viewing critics contend children engage in, children are very active in attending to television. Between about two and three years of age, children acquire televiewing behavior, that is they begin to orient themselves to the television set, tuning in and out during the programs and commercials. Monitoring of television is elicited and maintained by various kinds of visual and auditory elements on television, some of these elements are more successful in capturing young children's attention than are others. Moreover, it appears that changes in the audio have the greatest impact in drawing children's attention back to the set if they are not attending. Finally, there is some initial evidence that the comprehensibility of the television message is important in maintaining the child's attention, when the message is relatively unintelligible for children of a certain age level then continued attention is unlikely. In short, the picture emerging regarding how children attend to television is very much in keeping with the active nature of cognition: children do appear to be actively and selectively attending to the television screen.

Although the literature surveyed regarding children's patterns of attention to television appears in contrast to much of the conventiona' discussions of television's narcotic effects and the passive nature of television watching, this may not be the case. An argument can be advanced that watching television is inherently less active than "doing" some other activity such as playing games, engaging in sports or other athletics. Actively "watching" television should not be equated with actively "doing" some other sport or activity which engages the child's body and mind.

Comprehension of Television Messages.

The literature surveyed so far regarding children's attention to television has relied on observation of visual attention by the child viewers. Measures of visual attention alone do not provide an indication of what aspects of the message children are extracting from the television screen. In order to acquire indications of this, researchers have relied on post-viewing measures of children's recognition and recall of information from the program. This research will be considered in this section on children's understanding of television messages. Here the concern is not with what children are looking at and listening to, but what do they remember from the TV and what meaning does the TV content have for them?

Much of the research which has adopted a cognitive developmental perspective on studies of children and television has examined children's comprehension of television messages. The underlying assumption of these studies is that children bring different cognitive abilities and social experiences to the TV viewing situation and that these then influence how children make sense of the messages. Younger children with more limited inference-making ability, are more likely to focus on the consequences of actions rather than the motivations of the actors and oftentimes are shown to construe the television plot line quite differently from older children and adults. The way in which children do construe meaning from television cannot be directly inferred from cognitive development theory. Cognitive developmental theory may aid us in describing how children make sense of television, but we should examine children's understanding of television directly.

How then has cognitive development theory been used to study children's comprehension of television? First, several authors have relied on Piagetian

theory to provide evidence of some general cognitive ability such as the ability to focus on motivations when judging the goodness or badness of an action. They then attempt to demonstrate through experimental or survey procedures that children of a particular age or stage level accordingly do or do not use television characters' motivations when assessing their behaviors. Here is a clear cut example of directly borrowing developmental theoretical notions and demonstrating their applicability when children are processing television information. In other situations, however, cognitive development theory in general may be less useful in directly describing or predicting age-related changes in children's construction of meaning from television. For instance, we are only beginning to examine children's understanding of various kinds of filmic techniques such as zooms, camera movements, montage, etc. (See Salomon, 1979). One researcher in this area, Salomon (1979) argues that these and other sorts of filmic techniques, indeed, the whole symbol system used on television for representing reality, may actually play a role in accelerating or otherwise effecting cognitive developmental changes among child viewers. That is, Salomon argues for a reverse causality, that just as a child viewer's level of cognitive development may lead him/her to interpret television in a certain manner, television viewing may lead to changes in his/her level of cognitive abilities. This is a relatively new hypothesis in the literature which has received little testing.

Television content may pose particular difficulties for children to understand on a number of levels of "understanding." First, children must interpret the social behavior portrayed on television. The typical dramatic program of people engaging in various kinds of interpersonal relationships in usual and unusual circumstances is presented in an abbreviated form on television. Viewers must make inferences regarding motivations of characters and inferences regarding the relationships between characters. Sometimes the cues utilized to enable

these inferences are exceedingly complex; sometimes character motives are not explicitly portrayed but must be inferred between scenes. The complexities of interpreting social behavior--even social behavior in day to day situations--is heightened on television because of the use of various production techniques. For instance, having an understanding that a dissolve from the face of one boyfriend to the next may be used to illustrate the heroine's ambiguous love relationships could be crucial to the plot. Young children who may not understand such production forms may have more difficulty interpreting the program plotline. Furthermore, use of various production techniques such as flashbacks requires that viewers leap back and forth in time and coordinate symbols which may tax and confuse the young child.

On another level, children must develop an understanding of television's reality--who are those people on television? When is television real and when is it fantasy? The events portrayed on television can represent a "magic window" reality (Hawkins, 1977) showing the child places and people beyond their everyday experiences. However, the characters are "acting" and the programs themselves are drama and not real life. Such understanding about the reality of the events portrayed on television and about the characters on the programs may develop only gradually.

Finally, television has a programming structure which should be understood by the viewers. Programs are distinct from advertisements and other sorts of announcements. Children must come to understand, at the most simplistic level, that advertising content is different from other types of programming, and futher that the motivations of advertisers should be considered when interpreting the advertising message.

In the remainder of this section consideration will be given to each of these issues. First, age-related differences in children's abilities to accurately

recognize dramatic plotlines will be discussed. Secondly, children's perceptions of television characters and developmental changes in such perceptions are reviewed. A brief discussion of the role of various audio-visual filmic techniques in aiding or confusing children's understanding of television messages is then offered. Lastly, a brief discussion of various types of understandings children acquire about the medium of television, such as understanding of the economic structure of television, completes this section.

1. Children's Comprehension of Television Narratives.

The traditional dramatic plotline which is used in most narratives, either in print or on television, has a predictable pattern: there is an initiating event where the scene is set, (boy meets girl); events proceed to a crisis (parents intervene to stop the budding love); followed by a resolution of the crisis (boy and girl win over parents to the romance); and the denouement (boy and girl show parents they can live happily ever after). While many television programs involve sub-plots or other incidental characteristics, adult viewers of a television program can easily fill in a new viewer half way through a program by reiterating the major points of the plotline. They can bring the new viewer up to date. Part of the reason we, as adults, are capable of doing this, is because we easily recognize plotline structures, and on the basis of both previous experience with television and experience with social relationships we can oftentimes predict fairly accurately the future course of a plotline. Thus, we as adults are capable of recognizing major events central to the plot as they unfold.

There is evidence from research on children's memory for central plotline information, that children only gradually develop this kind of understanding of television plotlines. The evidence indicates that (1) young children have

difficulty selecting essential from nonessential information from a dramatic story--and (2) young children may not be attempting to organize and draw inferences about the behavior or story unfolding on the screen.

Children's abilities to select essential plot information from a dramatic program has been shown to have strong age related increases. Across several studies Collins (1970, 1973, 1979) and his colleagues have utilized a procedure to examine children's memory for central plot information. This procedure involves showing groups of adults a dramatic or situation comedy program and then interviewing them about the program, specifically about which scenes they considered essential to understanding the plotline. A series of multiple choice recognition items are then constructed about the program. Some of the items measure information central to understanding the plot, others are incidental to the plotline. Groups of children of various ages are then shown the television program and after viewing are given the multiple choice tests.

Across several studies, two findings emerge, first that, overall, children's memory for the scenes in the program increases substantially with age; and secondly, children's memory for the "essential" information for understanding the plot also increases with age. For instance, in one study where second, fifth and eighth graders were tested on their recognition of essential plot information from a detective program, second graders recognized an average of only 66 percent of the essential scenes, fifth graders 84 percent and eighth graders 92 percent or nearly all of them. Similar age differences were found for children's memory for central information from a situation comedy program (Collins, 1970). Other researchers have noted similar differences in children's memory for central plotline information from television programs (Hale, Miller and Stevenson, 1968; Hawkins, 1973; and Katzman, 1973). Moreover, young children have been found to have difficulty even ordering scenes of a plotline into the correct order. Leifer, et al. (1971) showed children four, seven and ten years

old a short narrative film. After watching the film, children were shown groups of 3, 5, 7, or 9 photographs and asked to reconstruct the scenes in the correct order. Only four of the 20 four-year olds tested could correctly order the three photographs and none were able to order the groups of 7 or 9 photographs. By contrast, most of the older 10-year old children were consistently able to reproduce even the 9 photo sequence into their correct narrative order.

What are possible reasons for the younger children's rudimentary understanding of narrative information? First, evidence from several studies suggests the younger children may not be focusing their attention on the "essential" information. For instance in the research by Collins, memory for nonessential information in the programs (such as character's hair color, dress, room furnishings) also tends to increase until junior high school and then decrease. Similar findings are obtained in studies of incidental learning in a variety of specific tasks (Hagen and Hale, 1973). In general, these studies suggest that as children grow older their ability to know what is important in the plot increases and they acquire greater control in allocating their attention and focusing on what is important. This increased control in attention has been found in other sorts of information processing tasks. Comstock et al. (1979) refer to this as child viewers having to "learn to learn" what is important and what is not important information in a plotline.

In addition to this "learning to learn" hypothesis, it is also likely that as children's general memory capacities increase with age, so too does their ability to remember parts of the programming. Collins (1979), however, makes the argument that in addition to memory deficiency, other factors may account for the differences in the younger children's understanding of narrative plot. In a rather ingenious study, Collins (1979) examined children's attempts to organize and integrate plotline information as the program proceeds. In this

study, Collins showed second, fifth and eighth grade children a detective show where the scenes of the plot were randomly ordered or jumbled, or a version where the scenes were in their original order. When asked questions that required causal inferences about relationships between the scenes of plot, the second graders, even when they had the central information from each discrete scene to do so, correctly answered far fewer of the inference questions than did the older children. Collins argues that the young children not only recall less information from the television shows but also do not appear to be organizing the information in a meaningful fashion as they watch the program. The older, fifth and eighth graders, in contrast, appeared to be trying to make sense of the programs. While they answered more inference questions than did the younger children, these older children were confused by the jumbled versions of the show and answered far fewer inference questions about the jumbled version than the ordered version, that is, they showed poorer comprehension, and annoyance about the less comprehensible program.

Younger children's lesser ability to recognize essential plotline information, to select it and organize the scenes in a causal fashion has been shown in various manners by several research studies (Collins, 1979; Flapan, 1968). It seems likely that children even as old as second and third grade construe different meanings from a television show than do older children and adults. The difference in meaning will arise from the different cues the younger and older children recollect from the program and piece together to derive plot understanding. Similarly, these younger children appear to view television characters in a different manner.

2. Children's Understanding of Television Characters.

Just as there is evidence that children only gradually acquire adult-like comprehension of narrative forms, research on children's understanding of other

people indicates similar age-related trends. As was noted in the first section of this paper, general cognitive development research has shown decided age changes in children's understanding about other people--in particular there is movement from egocentric to non-egocentric views of others occurring about middle childhood and the development of the concrete operational stage of development. Just as children are developing an understanding of others' points of view, their impressions of other people change in terms of the kinds of characteristics focused upon to describe others.

Several studies of children's descriptions of their friends and others have noted age-related changes in the content of these free descriptions (Dornbush, Hasdorf, Richardson, Muzzy and Vreeland, 1965; Peevers and Secord, 1973; Scarlett, Press and Crockett, 1971; and Livesly and Bromley, 1973). The general dimensions of change appear to be that as children grow older they describe others less often in terms of external characteristics, such as overt physical descriptions and appearances, and more in terms of "internal" characteristics, such as personality traits and motivations. Wartella and Alexander (1978) report similar findings for second, fifth and eighth grade children's descriptions of television characters. They had children describe a television father, mother and child. While the preponderance of descriptions at each age level focused on the actions the characters performed, eighth graders did use more personality trait and motivational state descriptors than did fifth or second graders. Second graders on the other hand, were more likely to describe the characters in terms of physical characteristics, appearances and possessions. Moreover, the fifth and eighth grade children were more likely to attribute causes to the character behaviors they discussed by making references to the character's motivations for the behaviors. Similar findings are reported by Alexander and Wartella (1979) in a replication of this study.

Reeves and Greenberg (1977) and Reeves (1979) report that when children are asked to compare a variety of television characters, third, fifth and seventh grade children use similar traits in the comparison. In both studies, the researchers used a multidimensional scaling system[2] to determine the underlying dimensions children use to differentiate or compare one character with another. They report no age differences in their study: they determined that children at each age level, third, fifth and seventh grade, utilized four main attributes in differentiating characters: humor, physical strength, attractiveness and activity. Reeves (1979) attempts to resolve the lack of age-differences in these multi-dimensional scaling studies with age-differences found in studies of children's free descriptions of television characters and real people. He argues that differences between the studies may reside in the two methods used or the tasks employed (a comparative versus descriptive task); that is, the differences may be methodological. The two methods may require that children focus on different aspects of people in complying with the researcher's requests. However, if the study differences are not just methodological, Reeves offers an alternative theoretical explanation: children may learn fairly early, by third grade, that television characters are relatively simplistic people and only simplified discriminations among them need be made. Thus, while Reeves and his colleagues find no age differences in the underlying dimensions children use to compare television characters, other descriptive studies as noted above have found age differences in how children describe TV characters. The difference in findings from these research approaches has not been resolved.

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[2]Multidimensional scaling is a statistical technique that looks at how subject's ratings of a variety of variables group together; that is, it seeks to determine underlying dimensions which describe the relationship among a set of variables for a given group of subjects.

There is support from other research for the finding that children only gradually come to develop an understanding of the motivations and consequences of characters' actions. In a series of studies, Leifer and Roberts (1972) examined kindergarten, third, sixth, ninth and twelfth grade children's understanding of the motivations and consequences of aggressive actions. They report that although kindergarteners understood (as measured through a multiple choice recognition test) only about one-third of the motives asked about, third graders understood about half of the motive cues and the high school seniors understood nearly all of the characters' motivations.

Collins, Berndt and Hess (1974) further examined children's comprehension of the motive-behavior-consequence linkage. They argue that, in keeping with Piaget's research on the development of moral judgments in children, the bases of the child's judgments of television acts shifts at about age nine or ten from evaluations based on the consequences of the act to more intention-based evaluations of acts. In a non-experimental procedure they examined whether this might be the case in children's evaluations of television actions. Collins et al. (1974) showed kindergarten, second, fifth and eighth grade children a specially edited version of an aggressive television program. When the children were asked to recall the aggressive action, kindergarteners mentioned only the action, while second graders mentioned both the action and consequences. Fifth graders mentioned either the motive-behavior linkage or the behavior-consequence linkage, and the majority of eighth graders provided the entire motive-behavior-consequence linkage in their recall of the program. In short, the older children knew that person A killed person B for a certain reason and with a certain consequence; these older children were able to articulate the causal relationships among the action events.

There is some evidence that part of the difficulty young children have in understanding motivations for character behaviors resides in the relatively ambiguous and complex presentation of motivation cues on television. Furthermore, motive cues are often separated in time from the behaviors they elicit. There is evidence that when motives for actions are very explicitly stated and occur contiguous to the actions they elicit, even children as young as second graders can recognize them (Berndt and Berndt, 1975). The manner in which these social cues are portrayed, then, may be important for children's understanding of characters and their actions.

In summary, research on children's understanding of television characters suggest that during the elementary school years, children have difficulty understanding characters' motivations for actions. Kindergarteners seem to be the most deficient at this and high school children the most adept. By fifth grade, there is evidence, however, that children begin to describe motivations for why characters behave as they do (Wartella and Alexander, 1978); recognize motive cues in multiple choice tests about a given television program (Leifer and Roberts, 1972) and offer explanations of motives when describing television plotlines (Collins et al., 1974). However, there may not be developmental differences in the underlying dimensions or traits children use to compare one television character with another, according to Reeves' (1979) research.

Unfortunately, we have relatively little knowledge regarding the effects of various kinds of television production techniques or the audio-visual symbol system on children's comprehension of television messages. While systematic research in this area is only beginning there are some preliminary indications of age-related growth in children's understanding of filmic techniques. This research will be considered next.

3. Children's Understanding of Audio-Visual Techniques.

Various sorts of production techniques, such as cuts, zooms pans, montage, are routinely used in television programs. Research on children's understanding of these "formal features", the symbol system of television is sparse. There is some indication that children's confusion regarding interpretations of television messages may be the result of their misunderstanding of these formal features of television. For instance, Dorr (forthcoming) reports that the five-to-seven year old children she talked with could not understand how Steve Austin, the Six Million Dollar Man, could catch the bad guys when he ran so slowly. These children obviously were not interpreting the use of slow motion as an indicator of bionic strength.

Some indication of children's relative lack of understanding of television production features comes from research by Tada (1969). He examined Japanese children's comprehension of film images. He found strong age-related differences in children's understanding of various production techniques and their relationship to theme development. For instance, in one study he presented elementary school children with an industrial film about the development of factories along Japan's coastal fishing villages. The film opened with scenes of quiet fishing villages and then cut to groups of factories being built along these shores. Fewer than half of the third grade children who saw this film were able to predict the effect of the factories on these fishing villages as intended by the producer, and further, these children had difficulty understanding any connection between these two scenes. He found elementary school children had difficulty understanding and predicting the direction of theme development in the film, and much of the difficulty stemmed from misunderstanding production techniques. His interpretation is that the young children had not yet learned to "read" film images and understand the symbolic meanings of different film techniques such as scenic shifts, rhythym montage and image symbolism.

Research by Huston-Stein (1977) in the United States and Salomon (1979) in Israel tend to support this interpretation. They find variations in the use of formal features such as zooms, fades and pacing affect comprehension of the program. Huston-Stein (1977) for instance is currently examining the effects of various auditory features which have been found to affect attention on comprehension of the program. Also, Singer and Singer (1979) in reporting current research argue that some of the production techniques used to capture children's attention such as fast pace may actually hinder young children's learning from television and in the classroom.

The precise nature of children's understanding of various kinds of production techniques has not been detailed. There is some evidence that at least major change points in the structure of television programs are processed by children as young as third grade, even where fancy camera techniques may not be understood. For instance, Wartella (1978) reports an examination of the size of "units" children use to chunk a television narrative into different happenings in the program. She found that third graders used smaller units to divide the stream of behavior in the narrative portrayal than did ninth graders or adults. However, major break points in the action, or changes in the direction of the behavior stream, noted by ninth graders and adults were also noted by the third graders. These third graders appeared to have learned at least the basic changes in audio-visuals such as the use of cuts to indicate changes in direction of theme development.

Salomon (1979) is examining how the symbol system of television may act to "supplant" the child's level of cognitive skills to "cultivate" the development of mental skills. In his research, Salomon has been examining the impact of various kinds of camera techniques on comprehension and their relationship to the development of mental skills. For instance, he has examined the role of the

zoom as a camera movement which relates parts of objects to the whole object and has compared this to the child's ability to relate parts to wholes. His research question is: can use of zooms aid children's development of an understanding of how parts are related to wholes? He argues that visually the zoom can supplant the child's ability to make the connection between parts and wholes on his or her own. Furthermore, he then asks, might not television's symbol system aid in the development of other mental skills in children. He suggests that heavy users of television who are working at making sense of the television visuals may acquire various kinds of mental skills more quickly. He reports, for instance, that with the introduction of Sesame Street in Israel, second and third grade children who viewed the program acquired mastery of various sorts of mental skills, such as relating parts to wholes, as a result of exposure to the symbol system of the program.

Salomon (1979) further reports the results of a cross-cultural study of Israeli and American children's mastery of various sorts of mental skills. In this study fourth and sixth grade children were studied. First, he found that Israeli children remembered more of the content of television programs they reported to watch the previous day, that is, Israeli children were more likely to engage in what Salomon calls "literate viewing" than were their American counterparts. Not only did the Israeli children appear to be watching television more "seriously" according to Salomon but they showed greater mastery of mental skills than did their American counterparts, and in particular the Israeli "literate" viewers showed greater mastery of precisely those mental skills (such as series completion) which correlated with literate viewing but not of those skills which did not correlate. Salomon argues that the low correlation between viewing and mastery of mental skills among the American sample may be the result of the "less serious" televiewing by the American children; that is, the American

children may not be trying as hard to make sense of the television programs and extract information from them. Salomon's research represents an unusual hypothesis in the literature and has not been replicated by other studies.

Our knowledge of children's understanding of the various techniques used in production of television programs is still rudimentary. The research to date does suggest that understanding some of the symbols of the audio-visual medium probably does not develop until children acquire mastery of other abstract information processing abilities, such as relating parts to wholes, and have greater experience with watching television. Unfortunately, we have little evidence pinpointing where confusions arise in interpreting television messages as a result of the use of particular production techniques.

4. Children's Understanding of the Television Medium.

The content of television can be real-life as in a news show and it can be fantasy as in many comedy or drama programs. Sometimes television tries to entertain without engaging the viewer's intellect and other times it tries to persuade the viewer to adopt a certain point of view or buy certain products. How do children understand the nature of television programming? Can they recognize reality from fantasy? Can they distinguish among different kinds of programming? When do they understand that advertising is different from other programming? These are questions about children's understanding of the medium of television.

Several studies have reported that as children grow older they are less likely to report that television is "real" or that television people are like people in real life (Greenberg and Reeves, 1974; Lyle and Hoffman, 1972; Noble, 1975). In particular, preschoolers and kindergarteners have been shown to have difficulty understanding that television programs are make-believe and television characters are actors. These young children are reported to believe that television

people live in the television box (Lyle and Hoffman, 1972) and know the viewer just as the viewer knows the characters from television (Noble, 1975).

Furthermore, Noble (1975) argues that young children engage in parasocial interaction with television characters, that is, that television characters are viewed as real people and real friends with whom to interact in play and real life. Television seems a very real world indeed to the young child, a world in which they become emotionally and cognitively involved. However, evidence of such parasocial interaction is weak and has not been much studied.

While television may not be real in the sense that preschoolers talk to and use it, it does present some events realistically, that is, in a real-life manner. Perceptions of television as real in the sense that television portrays events and people in a real-life manner may be accurate perceptions of the medium. Television does show how people eat, dress, and engage in other sorts of everyday activities. This is not to say that television does not engage in stereotyped portrayals. Television may stereotype different racial, ethnic groups as well as men and women; and yet at the same time some aspects of the portrayals are realistic.

Similarly, Hawkins (1977) presents evidence that the construct of perceived reality may have several dimensions and that the general findings that perceived reality decreases as children grow older may only refer to one dimension. In particular, he found that between first and third grade there is a marked increase in understanding that most television programs present fiction or actors playing parts and are not pictures of actual events. That is, between first and third grades children realize that television is not a "magic window" on the world, as the preschoolers and kindergarteners are reported to discuss television's reality. He found a different age pattern, however, for children's perceptions of television people and events being like real life, what he calls the social

expectations dimension of perceived reality. There was no age-related decrease in children's perceptions of television characters as similar to people in real life, at least through the sixth graders he studied.

It seems likely that children's perceptions of television reality are as multiple as the phenomenon would suggest. For instance, that while Archie Bunker is not a "real person" you and I may meet on the street, he may act like "some real people" you and I know. Moreover, "how" much like real-life people we perceive Archie to be depends on our experiences and perceptions of Archie as a stereotype.

The major hurdle may be for children to understand that television people are actors portraying events. This understanding seems to occur between first and second grades. Understanding that television people may be like real people, or that television people may be useful in showing the viewers how to behave may not decrease with age. This finding may account for the often cited statistic from Lyle and Hoffman's (1972) study which found 25 percent of tenth graders interviewed reporting that people on television were like people in real life. Indeed, television people often do act like people in real life even when the characters are stereotypes. It seems reasonable that children might recognize these similarities.

Just as understanding the reality of television appears to be multidimensional, so too might children's understanding of the structure of television programming. For instance, there is evidence from several studies that between kindergarten and third grade children acquire the knowledge that television advertising content is different from programming because the former tries to sell products (see Adler et al., 1977 for a review). However, comprehension of the relationship between programming, advertising and audience size, that is, the basic economic structures underlying the television industry is a more complex notion to understand,

one with which many adults might have difficulty. Dorr (forthcoming) reports that none of the elementary school children she spoke with understood the complex economic basis of television programming and advertising. To the best of our knowledge, children have only rudimentary understanding of the business of television.

5. Summary of Children's Understanding Television Content.

The picture which emerges of children's understanding of television is one which indicates that, on a number of dimensions, children in elementary school are not so competent as adults in processing television messages. By kindergarten, when adult-like televiewing begins, children have rudimentary understanding of television characters, and actions, probably perceiving television in discrete action bits. Preschooler's interpretations of television programs are probably quite idiosyncratic. Children as old as second and third graders (up to about ages eight or nine) have been shown to have difficulty in identifying program information which is considered by adults to be central to understanding plotlines. Further, these relatively older children have been shown to have difficulty explaining character motivations for behavior and tend to describe characters in terms of very surface characteristics, such as appearance and behaviors.

Similarly, understanding about the television medium as an economic business is only rudimentary in grade school. In particular, public controversy surrounds the question of children's knowledge and awareness about advertising content on television. In the next section, consideration will be given to several of the research studies regarding when and how children acquire an understanding of advertising content as distinct from other types of programming.

Children's Understanding of Television Advertising.

In this last section of the paper several pragmatic questions about age-related changes in children's comprehension of television advertising will be discussed. Three major questions will be considered: how do children discriminate between programs and commercials? what is the nature of children's understanding of the concept of television advertising? what is the nature of children's memory for commercials?

1. Program-commercial separation.

Questions of children's awareness of programs as distinct from commercials revolve around the issue of what constitutes awareness. Is evidence of shifts in attention level when commercials come on the screen an indication of "awareness?" Or must the child be able to articulate functional, conceptual explanations of the differences between the two types of content?

Evidence from studies of children's attention to commercials suggests that children as young as three or four shift attention upward at the onset of a commercial (Wartella and Ettema, 1974; Zuckerman et al., 1978). Attention to the screen during the commercial has been found to decrease and then shift upwards again at the onset of the second commercial in a sequence. Only Ward and Wackman (1973), who had mothers observe their children watching television in homes rather than utilizing trained observers in a controlled viewing situation, do not find movement toward higher attention for young children at the onset of commercials.

Advertisements when embedded in programs seem to represent the kind of "bit changes" Anderson and his colleagues have been studying as mentioned in section II. In one study, Ward and Wackman (1973) found five to twelve-year old children's visual attention to the set to decrease at the onset of a commercial--that is attention went down in the transition from program to

commercials. This differentiation in attention was found most strongly for the higher cognitive level children, or those older than age 8. In this study mothers observed their children in the homes watching television and recorded their observations.

However, in two other studies, where trained observers recorded children's attention in controlled viewing rooms an increase in attention at the onset of a commercial after breaking from a program was found (Wartella and Ettema, 1974 and Zuckerman, et al., 1977, 1978). This is in contradiction to Ward and Wackman. Wartella and Ettema (1974) observed nursery, kindergarten and second grade children. They found that the youngest age group, in particular, showed variation in attention to commercials depending on the commercials perceptual activity--the more visual and auditory changes present in the commercial the more likely it was to elicit full attention by the nursery schoolers. The second graders attention was less susceptible to variations in perceptual complexity; these children showed uniformly high attention to the commercials.

In contrast to the Wartella and Ettema study, Zuckerman et al. (1977) found second, third and fourth graders who watched a 15 minute presentation with four commercials embedded in program content to show relatively low mean attention to the commercials. In both studies, the pattern of attention to the commercials was comparable: movement toward higher attention at the onset of a commercial with attention falling during the commercials; then again movement toward attention at the onset of a second commercial in the series or at the return to the program.

Two studies which have examined children's attention to clustered commercials, Duffy and Rossiter (1975) and Atkin (1975) have found clustering of commercials in blocks does not decrease young children's attention. For instance, Duffy and Rossiter showed groups of first and fourth grade children either a

clustered commercial/program format or the traditional dispersed commercial/program format in a classroom viewing situation. Observers estimated the percentage of children in the class at "full attention" to each commercial shown the children. First graders had slightly higher attention to the clustered commercials than to the non-clustered commercials. Fourth graders showed lower attention to the clustered commercials than non-clustered. Atkin found higher attention to clustered commercials in his study of preschool through fifth graders. He reports no age differences (Atkin, 1975).

The recent research on children's patterns of attention to television would suggest an explanation for attentional shifts toward full attention when commercials come on the air. If it is the case that by age five children have acquired adult-type viewing patterns which involve monitoring the screen interspersed with periods of inattention, then any perceptible changes in content should attract viewer's attention. It would seem likely that changes in the visual and audio channels, if even for a split second, are enough to capture an inattentive television watcher. Such changes in television content occur in the movement from programs to commercials and also from one commercial to another. Strong audio and visual shifts (even a blank screen) would appear to be cues even kindergarten children use to note changes in the content of the television and cue which help them monitor their television watching. Such cues should result in looking at the television for children who are visually inattentive and perhaps other shifts in attention for children who have been attentive. It would seem to be the shift in content alone, independent of whether the commercials occur in clustered or dispersed formats which heighten attention.

In addition to shifts in attention at the onset of commercials, children as young as four have been shown to have some other sorts of perceptual awareness of program-commercial separation. Gianinno and Zuckerman (1977) have shown that

about 50 percent of the four-year old children they interviewed could correctly pick out a picture of a television commercial character when paired with a TV program character in 8 out of 10 comparisons. On the other hand, nearly all of the seven year old children they interviewed could recognize the commercial characters when presented with the ten paired comparisons. Furthermore, when asked to choose the picture of a character that shows products on television nearly all of the four and seven year old subjects were correct in recognizing the television characters in 8 of 10 paired comparisons.

Nevertheless, it is difficult to equate such perceptual discriminations as evidence of conceptual understanding of the functional differences between programs and commercials. While children may be able to recognize perceptual features of commercials such as characters of commercials, it is an inferential leap to assume this is evidence of understanding the purpose of commercials. Most tests of conceptual understanding of the distinctions between programs and commercials have relied on verbal measures of children's articulation of differences. For instance, Ward and Wackman (1973) report that 79 percent of five-eight year olds they interviewed distinguished the two types of programming in largely perceptual terms, that is that commercials and programs have different characters and are of different lengths. On the other hand, they report that 73 percent of 9 to 12 year olds offered functional differences in making the distinction, such as that commercials tried to sell products and sponsored programs. Even lower estimates of functional discriminations are reported by Giannino and Zuckerman (1977): only 12 percent of the seven year olds and 25 percent of the 10 year olds they interviewed could articulate that commercials try to sell products.

Awareness of the distinction between programs and commercials appears to proceed from perceptual discrimination (evidenced as early as age 4 in attentional

patterns) through recognition and articulation of perceptual differences by kindergarten and first graders, to higher level understanding of functional differences somewhere between kindergarten and second grade. Depending on the criterion for what constitutes "awareness of the difference between programs and commercials" different age levels can be said to be aware. Perceptual discrimination, however, does appear to precede conceptual discrimination.

2. Children's Understanding of the Purpose of Commercials.

Research on children's understanding of the purpose of commercials has relied on verbal measures of children's abilities to articulate the persuasive aspect of advertising. Results of the various survey studies seem to indicate that clearly below age six (kindergarten), the vast majority of children cannot articulate the selling purpose of advertising. Between kindergarten and second grade, that is between the ges of about 6 and 7 years, children have been shown to articulate the selling intent of advertising with various estimates or percentages at each age level. Variations in the percentage of children between kindergarten and second grade who appear to understanding the purpose of commercials appear to be the result of the measurement context question wordings and scoring systems.

Wackman, Wartella and Ward (1979) report estimates that range between one-tenth and one-half of kindergarten-aged children who do understand that advertising is trying to sell them products. In a survey study reported in 1977, they interviewed kindergarteners in their homes and asked them several different questions about the purpose of advertisements. In response to the question What is a commercial? only ten percent of the kindergarteners mentioned the persuasive aspect of advertisements. In the same interview, 22 percent of the kindergarteners reported that commercials try to get them to buy products in response to the question "What do commercials try to do?" Evidence from their experimental studies where children are shown commercials and then interviewed about the

factual information in the commercials produce even higher estimates of the percentage of kindergarteners who understand selling intent. They report that in response to an end of interview question, "What does this commercial for (product X) want you to do?", approximately half of the kindergarteners in various viewing conditions (and as high as 62 percent of the kindergarteners in one condition) say that the commercial wants them to buy or try the product.

As children develop beyond kindergarten and into late elementary school more complete and fuller understanding of the notion of persuasive intent and commercials role in broadcasting develops. Several researchers put the demarcation between rudimentary understanding and grasp of the persuasive aspect of advertising at age eight or older (Atkin, 1979; Roberts, 1979; Robertson and Rossiter, 1974). For instance, a slightly different criterion than that used by Ward et al. (1977) and Wackman et al. (1979) is offered by Roberts (1979) for what constitutes understanding of persuasive intent.

He argues that just understanding that commercials want someone to buy or try a product is not sufficient evidence of understanding the purpose and persuasive aspect of advertising. From general cognitive developmental notions and research on children's development of role-taking skills, Roberts develops an argument that not until about nine or ten can children take the advertiser's motivations into account when considering the advertisement. Children who lack role-taking skills are not able to recognize that because advertisers are trying to sell them products, the presentation of the product information may be biased. Roberts' argument is that children below at least eight years of age cannot be wary consumers of advertising messages. His argument reasons from general cognitive development theory and research, but it has not been put to direct empirical test.

Research does support the notion that as children grow older they do acquire fuller and more complete grasp of the notion of advertising, including the idea of sponsorship of programs. It seems likely that children's understanding of advertising proceeds from rudimentary ideas of commercials trying to sell products to more complete comprehension of the consequences of advertiser motivations in the presentation of product information in commercials as children grow older.

As the discussion of program-commercial separation and children's understanding of persuasive intent indicates, evidence of "understanding" or "awareness" varies depending on the standards to be used in judging these notions. If evidence of attention shifts when commercials appear on the screen is an acceptable indicator that children "discriminate programs from commercials, then three and four year olds can be said to make such discriminations. However, if other standards are used, such as the ability to articulate the notion that the selling intent of commercials distinguishes them from programs, then only a slim majority of kindergarteners at best, may meet this criterion. On the other hand, most third graders do meet this criterion. And if the criterion of "understanding" is articulation of the total economic relationship between advertising and programming including the idea of sponsorship, then even most sixth grade children are deficient.

In summary, children's understanding of advertising proceeds from showing evidence of perceptual discrimination ability, then rudimentary conceptual distinctions, through an increasingly better articulated grasp of the concept of advertising through the elementary school years. The beginning of conceptual understanding as articulated verbally by some kindergarteners, appears to be well articulated by nearly all children by the time they reach third grade. It is difficult to provide evidence of when children begin to take advertiser's motivations into account when assessing any particular advertisement's claims, although there is reason to argue, as Roberts does, that this does not occur until after

children understand that advertisements try to sell products. Throughout the elementary school years children build upon their understandings of television and advertising to acquire fuller and more elaborated grasps of these concepts.

3. Memory In Advertising Information.

In this section, consideration will be given to research on age-related changes in children's memory for advertising information. Two sorts of measurement procedures have been used: first, measurement of cumulative knowledge about advertising outside of a television viewing situation and secondly, recognition or open ended recall tests immediately after viewing television advertisements. Both sorts of measurement procedures have yielded essentially similar results: children's recognition and recall of the advertising messages increase as they grow older. Major increases in memory seem to occur between kindergarten and third grade.

Ward (1972) and Ward, Wackman and Wartella (1977) report studies of five to twelve year old children's recall of their "favorite" television commercial. Measures were taken in the course of an interview outside of a television viewing situation. The children's responses were content analysed for the number of commercial elements mentioned, the completeness of the storyline, and mention of brand name and other product features. The general finding from both studies is that children's recall for the commercials becomes more complete, coherent and unified as they grow older. Whereas the youngest, kindergarten children tended to recall a single element of the commercial (e.g. there was a girl playing with a doll) the older children tended to recall more product and commercial plotline information, they related the information in a sequence as to tell a story and generally gave a more unified multidimensional description of the commercial and the product. The major shift in recall from memory for one dimension to

multidimensional memory seems to occur between kindergarten and third grade according to Ward, Wackman and Wartella (1977). The older children recalled both more information about the commercial and more different kinds of information--that is information about the story line, brand name and product attributes.

Studies of children's memory for commercials they had just been shown tends to support these findings. For instance, Atkin (1975) reports several studies of children's memory for product elements in several specially produced commercials. In one study, a cereal commercial was produced which claimed that the cereal had four specific vitamins. Immediately after viewing the commercial, 90 percent of the eight to ten year olds interviewed could recall two or more details from the commercials while about two-thirds of the four to seven year old children interviewed could do so. Moreover, about half of the older age group of children could name all four of the vitamins mentioned in the commerical. One-seventh of the four to seven year old children could name all four vitamins.

Wackman, Wartella and Ward (1979) report three experimental studies of children's information processing of specially produced television advertisements. Kindergarten and third grade children were shown groups of television commercials for either candy products or toy products embedded in a half hour cartoon show in viewing rooms in their schools. A post-viewing interview with each child was conducted to measure their recognition and recall of advertisement information. One general finding across studies was that kindergartners performed better on multiple choice recognition measures than on open-ended recall measures of their memory for the commercials. Kindergartners generally performed at levels above chance on recognition measures (accurate recognition of about 40 percent of the product or commercial story line elements across recognition measures which offered three choice alternatives). Furthermore, when the information about a relatively

simple game product which the kindergartners appeared interested in was presented, they answered three-fourths of the recognition measures accurately. Nevertheless, kindergartners' recognition trailed third graders' recall and recognition memory. Across studies, third graders remembered between two-thirds and three-fourths of the product and commercial elements compared to the kindergartners 40 percent.

While the Wackman et al. studies involved children's memory for novel advertisements, there is evidence from other sources that even young children learn particular brand name slogans. For instance, Atkin (1975) reports that memory for slogans is well established by the time children reach grade school. In a survey study he presented three different slogans with the brand name missing. Almost half of the preschool-kindergarten children interviewed and 80 percent of the first to third graders interviewed identified the correct brand referred to in the slogan.

In summary, age-related increases in children's memory for commercials are indicated by the research. In particular, memory for brand name, and mention of attributes about the product seem to increase substantially between kindergarten and third grade. There seems to be some indication, also, that young children have an easier time recognizing product information through a multiple choice test than they do recalling product information via open-ended measures. In general, kindergartners perform less well in recollecting advertising information, even immediately after watching the ad, than do older, third grade children. These findings certainly are in keeping with the research on children's memory for television plotlines and narrative information as discussed in the previous section of this paper.

Section IV. Summary and Post-script.

In this section, the major conclusions presented in the three sections of the paper will be summarized. Also, implications of this review of children's understanding of television will be considered in light of current policy concerns.

The first section of this paper presented a brief description of cognitive development theory, particularly the work of Jean Piaget and critiques of this approach to examining the development of children's thinking abilities. A major conclusion of this review is that cognitive development theory and research argues strongly for the notion that children's thinking and interpretative abilities change radically as children grow older. Children's attention to and interpretations of the physical and social world follow several dimensions of change. First is the decrease in perceptual boundedness or the ability to go beyond immediate perception for cues to assess objects as children grow older. A second major dimension of cognitive growth is the development of decentration or the use of multiple dimensions of objects when assessing them. Thirdly, there is evidence that a major dimension of growth in children's interpretations of other people and the social world is the movement from more egocentric ways of perceiving and understanding others to mutual perspective-taking in understanding people's behavior.

Critiques of Piagetian approaches to cognitive development theory also have several implications for approaching research on children's understanding of television. First, one should be wary of making inferences from more theoretical literature on children's general cognitive development to the specify instance of children's responses to television. Secondly, the particular tasks and measures utilized in television research should be assessed in light of their appropriateness to the children's ability levels. Thirdly, the critiques suggest that stress should be placed on discussions of age-related changes in children's

understanding of television as opposed to "stage-related" changes in understanding.

The concept of age-related growth in understanding the medium of television is considered in the second section of the paper. This section reviewed the literature on children's attention to and comprehension of television content.

Evidence from attention research (mainly research on children's looking at television behavior) indicates that attention is influenced by the age of the child, the particular content attended to, and distractions in the viewing situation. First, by about age five, children's patterns of looking and not looking at the television set begin to approximate adult-styles of viewing. While at times children may appear glued to the television set (or zombie-like televiewing), these periods appear of relatively short duration, at least in laboratory studies. Secondly, there is evidence of selective viewing of television. Viewing involves monitoring of the television screen. Such monitoring, or patterns of viewing and not viewing, appear to be elicited and maintained by various kinds of visual and auditory elements on television. In particular, changes in the audio elements appear to have the greatest impact in drawing children's attention back to the set if they are not attending. Lastly, there is some evidence that the comprehensibility of the television message is important in maintaining the child's attention; when the message is relatively unintelligible for children of a certain age level than continued attention is unlikely. Children appear to be actively and selectively attending to television. This conclusion is not, however, evidence that televi ion watching is inherently as "active" or more "active" than other ways in which the child can engage his body and mind.

The li erature on children's comprehension of television content has found age-related changes in children's understanding of plotlines, perceptions of television characters, perceptions of the reality of television and comprehension

of the economics of the medium. First, children as old as second and third grade (between eight and 10 years) have been shown less proficient than older children in recalling those scenes of a television program adults consider essential to understanding the plotline. Furthermore, there is some evidence that children at this age level also are less proficient at drawing inferences about the relationship between scenes of the plot and may not be attempting to organize the plotline information in a meaningful fashion as they watch the program.

Similarly, during the elementary school years children have difficulty understanding characters' motivations for actions. Kindergartners through third graders have been found to be less adept at recalling characters' motivations for actions than are older children. There is evidence that by fifth grade children begin to describe motivations for characters' behaviors when asked to give a description of a television character; children recognize motive cues in multiple choice tests about a particular television character's actions; and they offer explanations of characters' motives when describing television plotlines. However, there is some evidence that the underlying dimensions or traits children use to compare one television character with another may not change as children grow older; humor, attractiveness, activity and strength are four dimensions which children of different age levels have been found to use in comparing television characters.

What little research exists on children's understanding of audio-visual techniques and the economics of television as a business, suggests that understanding of these aspects of the medium also undergoes age-related growth. Elementary school children appear less adept at understanding various sorts of production techniques such as flashbacks and slow motion than older children and adults. Furthermore, children in the elementary grades appear to have little comprehension of the economic relationship among advertising, programming and

viewership or other characteristics of the economics of television.

Further examination of the development of understanding of television advertising is offered in section three of the paper. The development of an understanding of the differences between programs and television commercials appears to proceed from perceptual discrimination (as evidenced as early as age four in attentional patterns) through recognition and articulation of perceptual differences between programs and commercials among kindergarten children. Higher level understanding of the functional differences between programs and commercials occurs between kindergarten and third grade. It is during the elementary grades that children develop increasingly better understanding of the purpose of advertising. By about third grade, children have been shown to articulate that advertisers want to sell them products. It is difficult to provide evidence that children at this age level do take advertisers' motivations into account when assessing any particular advertisement's claims, however. This may not occur until later than third grade. We do have evidence that memory for advertising information including brand name and attribute claims about products also appears to increase between kindergarten and third grade. Third graders show more complete, multidimensional and coherent memory for television advertisements than do younger children.

The major implication of this review for the current policy deliberations concerns the issue of age-specific programming. Is there a need for age-specific programming? On the basis of this review of children's understanding of television, I think that yes, there is a need for age-specific programming. Since children's abilities to interpret and understand television content changes particularly between preschool and the older, elementary grades, programming which takes into consideration children's abilities to interpret the messages is needed. Major demarcation points would appear to be between preschool and elementary

school aged children, and secondly, young vs. older elementary school children. Major changes in viewing and understanding television occur around third grade or ages eight to ten.

In addition to television programming which respects the child's abilities to interpret and understand the messages, there is also an implication of the need for future attempts to improve children's viewing skills.

Throughout this paper reference has been made to the notion that children are active cognizers of their world, that they are constantly making sense of objects and events around them. This sensemaking occurs within the limits of the child's level of cognitive abilities and set of social experiences. The same appears to be the case of children's interaction with television. The mental and experiential skills children bring to television have an impact in shaping the meanings they construe about the messages on programs and commercials.

Does this mean that the misunderstandings of the seven year old child about a program plotline or the rudimentary knowledge about advertising of a five year old cannot be changed until the children grow older? Can children be taught or aided to understand more about television earlier than current descriptions of their understanding indicates? Researc ers are currently examining this question.

As was pointed out early in this paper, Piaget's theory and other cognitive developmental research has often been presented as fixed and unchanging descriptions of how children of certain ages think and primarily the deficits of their way of thinking. However, evidence is mounting that stage guidelines for when children acquire certain cognitive abilities are not fixed, that children can be taught to acquire some cognitive abilities earlier than a given theory's age limit.

Similarly, there is some preliminary evidence that learning environments can be developed to help children acquire better understanding of television earlier.

For instance, there is evidence that adults watching television with young children can help highlight crucial scenes and help interpret the action on the screen (Stevenson, 1972). Furthermore, there is evidence that consumer learning programs can be developed to teach kindergartners elaborated notions about commercials, advertising and persuasive intent (Wackman, Wartella, and Ward, 1979).

Of course these programs must start with the child's current ability level and use teaching tools understandable to the child. Appropriate educational materials may help children develop critical viewing skills at earlier ages. Such receivership skills research is currently underway. At this point, it seems likely that appropriate learning materials will be developed to teach children about the medium of television, both its programming and advertising content. Such materials should aid children overcome their misunderstandings of television messages. By improving the skills children bring to the viewing situation we may be able to moderate the impact television has on the child.

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